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SCIENTIFIC ASPECT OF THE ALCOHOL QUESTION.

THREE PAPERS

READ IN FAVOUR OF THE

General Section of the Church of England Temperance
Society,

BY

PROF. C. GORDON RICHARDSON, DR. COVERNTON, AND
DR. T. F. McMAHON,

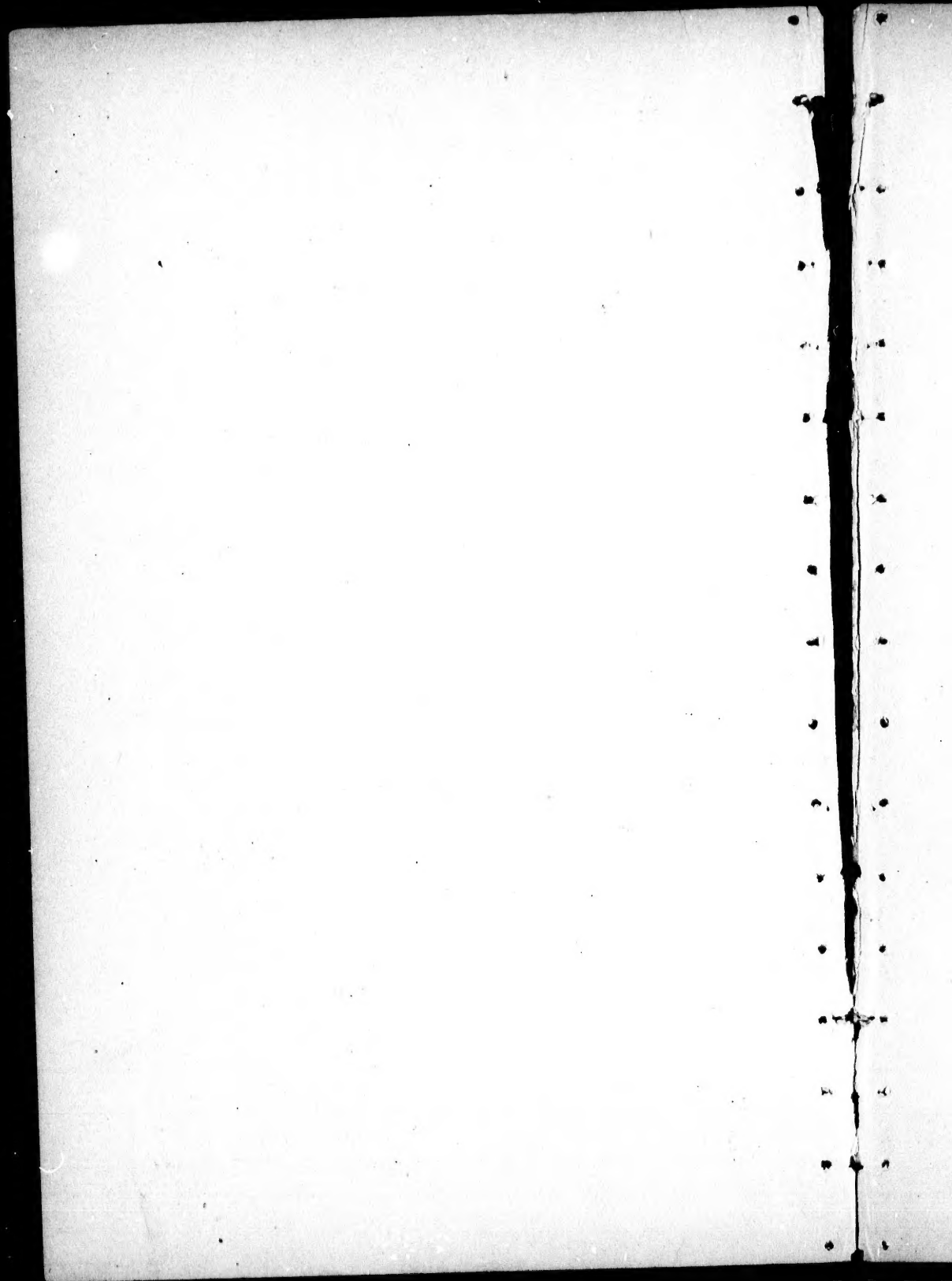
AT THE GENERAL CONFERENCE

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SCIENTIFIC ASPECT OF THE ALCOHOL QUESTION.

BY G. GORDON RICHARDSON,

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MY LORD BISHOP: LADIES AND GENTLEMEN:—I have been asked to speak at this Conference on behalf of the "moderate wing" of the Society. I accepted the proposal with pleasure; first, because I deemed it right that we should give our reasons for temperately using, for dietetic and beverage purposes, alcoholic stimulants, more especially as it is a custom often questioned at the present day; and, secondly, because I am convinced from long study of the question that medical and scientific opinion is overwhelmingly in favour of moderation.

But, it may be objected, many doctors are in favour of total abstinence. Dr. Oliver Wendell Holmes once said that "medicine, professedly founded upon observation, is as sensitive to outside influences, political, religious, philosophical, imaginative, as is the barometer to changes in atmospheric density." The majority of practitioners are often, it is to be feared, too easily swayed by popular public opinion, to be the *true* guides in this question, their practice depending largely, as it does, from day to day, upon their standing in the church or in society. If then we would obtain an opinion unbiased by the influences mentioned by Prof. Holmes, we must have recourse to the authorities in medical and chemical science, the authors of the "text" works, and the Professors in the leading universities of Europe and the States, though even these reflect in some degree the feelings, political and otherwise, of the times. To the opinions of such I shall confine myself this afternoon, fearlessly challenging our opponents to produce a like array from the accepted exponents of medicine and chemistry.

It has been stated that alcohol is not a food. On more than one occasion I have had to point out the falsity of such an assertion, and to detail the reasons, chemical and medical, which decide against such an assumption. Let me refer you to Dr. R. Brudenell Carter, F.R.C.S., the eminent consulting surgeon of London (Eng.), who recently said in the *Contemporary Review*: "If we come to inquire in what way this small dose (half a wine-glassful of brandy or whiskey) exerts a beneficial action, we are at once met on the part of many of the advocates of total abstinence by the assertion that alcohol is not a food. I have no inclination for a controversy about words; but if we may accept Johnson's definition of food as 'anything which nourishes,' I do not hesitate to say that the advocates of total abstinence are mistaken. I have recorded a case in which an old gentleman took no other food for many months, and was kept not only alive but in moderate strength and comfort, and with no remarkable emaciation, upon alcoholic drinks alone. He liked variety, and rang the changes upon champagne, old port, brandy, the strongest Burton ale and other liquids, some of which contained a certain amount of saccharine matter, but not enough to maintain life as he maintained it. Cases of a similar kind are recorded by the late Dr. Anstie and others; and nothing is more certain than that people will live upon alcohol and water for long periods. The evidence by which this is proved seems to me altogether to outweigh the opinions of those who declare that alcohol is not food, or no better grounds than that they are unable to discover

how it nourishes, or what transformation it undergoes within the body." In the same well known publication we have the testimony of the famous physiologist, T. Lauder Brunton, M.D., F.R.C.P., F.R.S. "We will first consider what claims alcohol has to be reckoned as a food, and perhaps this can be best done by comparing it with a substance like sugar, whose claim to the title of food no one doubts. If we find that alcohol possesses those qualities which entitle sugar to rank as a food, we must admit that it also deserves the name. Sugar disappears in the body as the fuel does in the steam-engine; and although it will not support life, if given alone, yet along with other food it will supply energy for increased work, or prevent the body from wasting. In these points alcohol resembles sugar. It disappears in the body; and although it will not of itself support life entirely, yet instances are on record of persons having lived for a considerable time with scarcely any other food. Hammond observed also, that when his diet was insufficient, the addition of a little alcohol to it, not only prevented him from losing weight as he had previously done, but converted this loss into positive gain. The objection may be urged that some observers have found alcohol pass out unchanged from the body and that it therefore cannot be ranked as a food. But the same objection applies to sugar, for the experiments just referred to were made with large quantities of alcohol, and when much sugar is taken at once, it will also be excreted unchanged."

Bearing witness to the same we also have C. B. Radcliff, M.D., F.R.C.P. (formerly Lecturer on *Materia Medica*, Westminster Hospital): "Alcohol, properly used, is of great service, partly in keeping up the animal heat by supplying easily kindled fuel to the respiratory fire, partly in producing nerve-power by furnishing easily assimilable food to nerve-tissue, and partly in lessening the necessity for ordinary food by diminishing the waste of the system which has to be repaired by food." Prof. James C. White testified before a joint committee of the Mass. Legislature in 1867, some years after the experiments and erroneous conclusions of the three French chemists, Messrs. Lallemand, Perrin and Duroy had been published. In reference to their conclusions that alcohol should not be classed as a food, he said: "They offered no evidence whatever." "There is evidence from their physiological action that under some circumstances, they act as food, in the same way for instance, as beef-tea does; their effects are precisely the same as food judging by their effects alone." To the question, "Is, or is not the theory of alcohol being a food generally accepted by physiologists?" he answered, "I think that it is."

Prof. E. N. Horsford, M.D., Ph.D., the well known chemist, testified before the same committee that, "alcohol comes under the head of respiratory food, which includes starch and oil. Perhaps the most recent experiment that has been performed is an experiment going to show that all these classes of bodies do actually fulfil the office of food, and that they do enable a man to perform feats of strength which he could not otherwise do."

Dr. Edward H. Clark again, Professor of *Materia Medica* in Harvard might be quoted to the same effect. Dr. Oliver Wendell Holmes, Parkman Professor of Anatomy and Physiology in Harvard, stated before the committee that alcoholic drinks had a proper use both *dietetically* and *medicinally*, and in answer to the question, "In what way do they act dietetically?" answered, "They act as food."

Professor Henry J. Bigelow, M.D., said that he had "no doubt that they did perform the office of food," and attributed their good effect to the "alcohol in combination with the other ingredients." To the question, "Do you believe that the ordinary usages of society require the use of stimulants?" answered "Undoubtedly, like all other habits, this habit is liable to excess." "Is that the strongest remark you would make?" "I should say that excess is not a good thing, but for a little excess you will find a vast amount of wine drinking, and the stimulus on the whole to the advantage of the individual." "On the whole, you would say that the drinking usages of the community about us are to be reprobated or deplored?" "Deplored? No, sir," was the decided reply.

Professor Chas. T. Jackson, M.D., formerly Prof. of Chemistry at Harvard, said that "alcohol and all alcoholic liquors act as foods" and in reply to the question whether the question of alcohol acting as food was unresolved? answered, "I do not consider it unresolved. It is not so considered by scientific men generally. There may be some doubts raised by some persons; but I think that the opinion of scientific men generally is the same on that point."

Dr. Anstie, the celebrated physiologist and writer, and late Prof. of Toxicology at Westminster Hospital, in his classical work on "Stimulant Narcotics" gives undoubted proof that alcohol should be classed as food. Dr. Pavy, in his recent work on "Food and Dietetics," after lengthy references to Anstie and Dupre, says, "From a review of the evidence as it at present stands, it may reasonably be inferred that there is sufficient before us to justify the conclusion that the main portion of alcohol ingested becomes destroyed within the system; and, if this be the case, it may be fairly assumed that the destruction is attended with oxidation, and a corresponding liberation of force."

But, to close the question of the "food" value of alcohol, let me refer you to the "Manual of Dietetics" just issued from the press, and from the pen of J. Milner Fothergill, M.D., of Edinburgh: "These last, and their names are both numerous and weighty, hold that alcohol is largely burnt in the body by oxidation, and is therefore a 'fuel-food.' Personally, after very considerable attention to the subject, I must say that I am among those who hold 'that the chief portion of the alcohol ingested undergoes consumption in the body.'" It is therefore, according to the latest authority on dietetics, to be classed with the starches and fats. And here I would like to draw the attention of this audience to the fact that, from the time of Anstie down to the present, no authority on dietetics has questioned the above.

So much for its being a food. Yet many of our opponents say, "It can not be food, for it is eliminated from the body unchanged." I need only say in reply, that the authorities just quoted are more recent than the three French chemists whose erroneous conclusion embraced in the foregoing has long since been repudiated. Even Dr. Richardson has the common honesty to give that argument up. In his Cantor Lectures he admits the fact that alcohol is decomposed in the body; nay, more, that it may be and is manufactured in the body. "In plain words Dr. Dupre's discovery suggests that no man can be in strict scientific sense, a non-alcoholic, inasmuch as, will he nill he, he brews in his own economy, a 'wee drap.' It is an innocent brew certainly; but it is brewed, and the most ardent abstainer must excuse it. 'Argal, he 'that is not guilty of his own death shorteneth not his own life.' The fault, if it be one, rests with Nature who, according to our poor estimates, is no more faultless than the rest of her sex."

Another favourite assertion of the teetotalers is that "because alcohol is poisonous in excessive quantities, it must of necessity be injurious in small doses." It would fare ill with humanity if this logic were sound, for it can readily be shown that there is nothing in the nature of an alimentary principle which is not injurious in excessive quantities. Salt, an article indispensable to the sustenance of life, is, when taken in excess a virulent poison. Orfila mentions several cases of death by its agency. Vinegar, mustard, pepper, tea, coffee, all contain principles which, taken in excess, are poisonous, and if the above logic were sound their use would be highly reprehensible.

But this is my opinion, you say. It is the opinion of the vast majority of physiologists and chemists. It is the opinion of Brunton, Anstie, Dupre, Thudichum, Pavy, Moleschott, King Chambers, and the many other authorities I have already quoted. Let us hear the Queen's physician on this point, Sir James Paget, Bart., F.R.C.S., D.C.L., L.L.D., F.R.S.:—"Then we have some deductions from physiological observations which are supposed to indicate a mischief in even habitual moderation. But some of these are really such that, if in the place of 'alcohol' we were to read 'common salt,' we should be led to conclude, if it were not for the experience to the contrary, that we are destroying ourselves by the daily excessive use of a material

which, in its excess, can alter the constitution of our blood or the permeability or other properties of our tissues." "But still," say our objectors, "if taken in moderation it may do no harm, still surely there can be no advantage in individual or even national indulgence." Surely our opponents are in a Carl Jean humour, and take the people to be "mostly fools." What says Sir James Paget? "The beliefs of reasonable people are doubtless by a large majority favourable to moderation rather than abstinence, and this should not be regarded as of no weight in the discussion." . . . "Thus, then, from all the witnesses to the evils of intemperance, we fail to get any clear evidence that there is mischief in moderation. Looking further, we find in them certain indications that it is, on the whole, generally beneficial." . . . "I have dealt with the question between temperance and abstinence entirely from the side from which my profession has enabled me to study it, so far as may justify my giving an opinion on it. My study makes me sure as I would ever venture to be on any such question, that there is not yet any evidence nearly sufficient to make it probable that a moderate use of alcoholic drinks is generally, or even to many persons, injurious; and that there are sufficient reasons for believing that such an habitual use is, on the whole and generally, beneficial. But as I have said, there are many, who, even if they would admit this, would yet maintain that the mischiefs of intemperance are so much greater than any conceivable advantages of moderation, that we ought not to promote or defend moderation, because its promotion hinders the general adoption of total abstinence, which they say, is the necessary and only sure remedy for intemperance. Here I can only doubt. I should think that in this, as in other things lawful yet tempting to excess, the discipline of moderation is better than the discipline of abstinence. As to working power, whether bodily or mental, there can be no question that the advantage is on the side of those whose who use alcoholic drinks. And it is advantage of this kind which is most to be desired. Longevity is not the only or the best test of the value of the things on which we live. It may only be a long old age, or a course of years of idleness or dullness, useless alike to the individual and the race. That to be most desired is national power and will for good working and good thinking and a long duration of life fittest for these; and facts show that these are more nearly attained by the people that drink alcohol than by those who do not."

Then the well-known metropolitan surgeon, Alfred B. Garrod, M.D., F.R.C.P., F.R.S.:—"The majority of adults can take a moderate quantity of alcohol in some form or other, not only with impunity, but often with advantage."

Professor Albert J. Bernays, Ph.D., consulting chemist and analyst to the city of London, say, that "If alcohol slay thousands, water has also its victims, and they are often the best of the race. The experience of mankind is better than individual experience, and so for every medical man of distinction who is in favor of total abstinence, I would find twenty who would be against it. And if a man is observant of himself and is temperate in all things, he is a better judge of what agrees with him, under ordinary circumstances than any physician can be. The principle I contend for is moderation rather than abstinence." Even the scientist, so often quoted by total abstainers in favor of their particular shibboleth, is not by any means so "sound" on the subject as some of his followers might wish. What, then, does he say. Sir W. W. Gull, Bart., M.D., F.R.C.P., D.C.L., F.R.S., says;—"In advising a young man of sound health as to whether he ought to give up alcohol I should consider his calling. I am not sure that I should not advise an out-of-door man, doing a good deal of work, a carter for instance, to take some beer, as a good form of food. I do not think we should be prepared to say that speaking of the labouring classes, everybody could go without beer as a food of light kind." Walter Moxon, M.D., another of the contributors to the *Contemporary*, stated that he believed that "to a large extent teetotalism lays foremost hold on those who are least likely to become drunkards, and are most likely to want at times the medicinal use of alcohol, sensitive, good-natured people, of weak constitution,

to whom the sacred ecclesiast directed his strange sounding but needful advice. "Be not righteous over-much, neither make thyself over wise: why shouldst thou destroy thyself?" To the great value of light wines for dietetic purposes numberless chemists, doctors and physiologists have testified. Speaking of clarets, Dr. Pavy says, "They form an exceedingly valuable kind of stimulant, both for the healthy and the sick. There is scarcely any condition in which they are likely to disagree."

Prof. Radcliff, again, says: "I cannot help saying that he who chooses to urge the poor to forego the *proper* use of alcoholic drinks for the simple reason that semi-drunkenness and drunkenness are, what they are indubitably, evils of incalculable magnitude, is no less than culpable—I cannot use a milder term—in a high degree. . . . I know that these persons are actuated by the sincerest wish to do good to their fellow-creatures, and that they are, at worst, no more than wrong-headed; but I cannot allow that goodness in the advocate for any particular cause is to be allowed to take the place of soundness in argument. Good wrong-headed people, you must allow, are very dangerous people."

Dr. Carter, again, already quoted:—"We may assure ourselves by common observation that the moderate consumption of alcohol is useful to many persons, and that it does not produce at least necessarily, or in any but exceptional cases, the dire effects which have been ascribed to it." Dr. Bernays says, also, that the "demands of town life on the nervous system, in the mere struggle for existence, are sufficient reasons for recommending the moderate use of wine." "As to the ability of individuals to exist without the use of stimulants, it is idle to urge," says Dr. Anstie, "that the subject of a carefully prepared experiment can be made to live in apparent health without the use of those substances vulgarly called 'narcotics,' if the practical fact be that nations cannot, and never have been able to do, without them. There is absolutely no period in the history of the world—there is absolutely no nation upon the face of the earth—in which indisputable evidence of their use may not be found."

The latest edition of "Chambers's Encyclopædia," a work of unquestionable authority has the following:—"As life advances, and the circulation becomes languid, wine in moderation becomes an essential, or, at all events, a valuable article of food, and even in early life the physician meets large numbers of townspeople, especially women, engaged in sedentary occupations, who cannot digest the national drink, beer, which is admirably suited to our outdoor labouring population, and to persons in higher life who indulge freely in open-air exercise. In such cases the beer is replaced by the more grateful beverage tea, which, however, when taken too freely and without sufficient food, often gives rise to a form of dyspepsia, which *too often impels the sufferer to seek refuge in spirits*. In many such cases cheap wine, which may be purchased under the new tariff at from 1s. 6d. to 2s. a bottle, mixed with an equal quantity of water, will be found an excellent substitute for the beer or tea." Then, as to the assertion of a reaction following the taking of a dose of alcohol, and that a renewal and increase in the quantity becomes a necessity, or to relieve the feeling of fatigue consequent on a hard day's work. To such, the first glass of beer is most grateful, and he turns away, the natural appetite satisfied; but he meets a friend, and, in accordance with the pernicious habit of treating, is asked to have a second glass. He refuses, the other presses, until at last, not to offend a friend (?), he offends his palate and stomach by wriggling down the second glass. There is not a man, under such circumstances, but what will not tell you that force was necessary to get down the glass,

that their sensations were only those of disgust. This disgust is the revolt, the "red danger-flag" of nature. This experience sometimes does not end with only the "second" glass, but may be prolonged to the third or fourth, and not on one day only, or two, but for weeks—aye, months and years, it may be—until tired nature gives way, and the wretched man awakes to find that there is no longer a "danger-signal" displayed, but *unnatural* appetite created which grows by what it feeds on, and the man has become a moral and physical wreck.

There is so much evil caused by intemperance, say our opponents, should we not forego whatever benefit we might derive from moderate indulgence for the sake of our "weaker brother." Here with Sir James Paget "I can only doubt," and that strongly. As a last refuge in support of this contention it is claimed that deaths from diseases of the liver and kidneys are increased fourfold, and that there is an increase in pneumonia. This is a very vague statement, but let us meet it, and for the following figures I must thank the Rev. J. G. Low, of Brockville, who has taken the trouble to collate them.

That we may give our opponents the benefit of every doubt, we will place *every single case* of death from kidney or liver trouble to the debit of alcohol. Then, taking the report of the Registrar of Ontario for 1884, we have alcohol debtor.

To deaths from alcoholism.....	34
" " " cirrhosis	41
" " " gastritis (inflammation of stomach)	138
" " " hepatitis (inflammation of liver)	205
" " " ulcer of stomach.....	37
" " " diabetes	70
" " " nephria (Bright's disease).....	121
" " " nephritis (inflammation of kidneys).....	169

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I beg pardon of those who are suffering from some of these diseases named. And for their comfort let me add that eminent physiologists, such as Dr. Flint (Professor in Bellevue Hospital College, N. Y., in his work on "The Practice of Medicine,") Dr. Anstie, and others repudiate the idea of alcohol being an important cause in kidney and liver diseases—and the 1,000 brewers of New York show a remarkable freedom from them. The only danger (and that is indeed very great) is from strong spirits taken undiluted. Now for the credit side. 1st. Dr. Farr, the Registrar-General of England, quoted by our own Provincial Board of Health, as the highest authority on medical statistics, thus writes of zymotic diseases:—"I invite the attention of those who have portrayed the bad effects of alcohol to consider whether it does not prevent the actions of various infections in the atmosphere. The neglect of this side of the question throws a doubt on many of their inferences. The deaths attributed to zymotic diseases (he is speaking of England) in 1876 were 96,660—to alcoholism, 1,120. Now it is evident that any effect depressing the prevalence of zymotic diseases that kill their tens of thousands *will save the lives of thousands.*"

Bearing this in mind, let us now sum up the list in which alcohol is creditor :

Number of deaths from zymotic (miasmatic) diseases.....	3,762
" " " phthisis (consumption)	2,347
" " " heart disease.....	958
" " " bronchitis.....	426

7,483

So, then, it seems that the diseases where alcohol might have *caused* death carried off their *hundreds*, while diseases where alcohol might have *saved* life carried off their *THOUSANDS*..

To ears accustomed to hear but one side of this vexed question, this paper may sound very shocking, and that, "even though it may all be scientific truth, yet, for the sake of morals," say they, "it might be well to teach otherwise." And

this has practically been said to the writer even by the Minister of Education. It will fare the cause that has to be supported by wrong teaching and false science. As Dr. Bernays says: "The children in our schools should be taught that the kingdom of God is neither in meats nor in drinks; that temperance does not merely apply to drink, and should proceed from right principles. In fine, that temperance is better than abstinence, and that its influence is far greater." "But who shall define this temperance, this moderation?" we are somewhat flippantly asked. I must again fall back upon Sir James Paget, who says: "Let those who thus ask try to define to the satisfaction of any ten persons what, under all circumstances and to all people, is moderation in bread or the wearing of jewels, in hunting, or in the language of controversy."

A PAPER BY DR. COVERNTON.

MR. CHAIRMAN, AND LADIES AND GENTLEMEN,—In reviewing the Scientific Aspects of Intemperance, I shall first take up the effects of alcohol upon the various organs and functions of the body.

1. *On the Stomach.*—In small quantities it may aid digestion; but in large it checks it, and lessens appetite.

2. *On Liver.*—Habitually, in large quantities, it produces, primarily, fatty deposits and increase of connecting tissue of the organs; and, secondarily, contraction of the latter, with atrophy of the portal canal and cells, inducing a condition of scirrhus, or hardening, called the "gin-drinker's liver," or "hob-nailed liver," from its appearance.

3. *On Lungs.*—Lessens amount of carbonic acid gas expired.

4. *On Heart and Vessels.*—It at first increases the force and frequency of the pulse, and dilates the capillaries by reflex action through the nerves of the stomach.

5. *On the Blood.*—It causes, when taken in considerable quantities, and for a lengthened period, a visible increase of fat corpuscles, which causes an accumulation of fat and fatty degeneration of various organs.

6. *On the Nervous System.*—It acts as an anæsthetic; lessens power of thought; and, in large quantity, paralysis. Cerebrum and cerebellum first affected, next the cord, and, lastly, the medulla oblongata.

7. *On the Muscular System.*—It lessens muscular power; and, in large amounts, paralyzes the respiratory muscles.

8. *Lowers the temperature,* and depresses the vital forces.

It undergoes combustion in the body like the other products of carbon, maintains the body weight, and prolongs life on an insufficient diet. It may, therefore, be reckoned *indirectly* as a food; the latter is, however, a disputed point.

Its remote effects are the degenerative changes in which the membranes and vessels of the brain principally suffer. It does not give additional strength, but merely enables the taker to draw upon reserve energy. It may thus give assistance in a single effort, but not in prolonged exertion.

Mortality.—In intemperate persons, the mortality between the ages of 21 and 30 years is five times that of the temperate. From 30 to 40 years it is four times as great, and, in increasing years, becoming gradually less,—

Age.	Life expect'n, Temperate.	Ditto Intemperate.
20	44.02 years	15.6 years
30	36.06 "	13.8 "
40	28.08 "	11.6 "
50	21.25 "	10.8 "
60	14.27 "	8.9 "

The foregoing evidence of its injurious effect on the system when used in an excessive amount, not only as proving injurious, but fatal to the individual also in the highest degree pernicious to society, render a discussion on such a self-evident proposition unnecessary. It is equally useless to dispute that there are certain alcoholic beverages, such as the distilled liquors whiskey, brandy and rum, which, when taken habitually, though in moderation, by healthy persons, exert a more or less injurious effect, varying according to the quantity imbibed and the constitution and temperament of the individual. Even fermented liquors—wine, beer, porter or cider—when used to excess, lead to results in many cases decidedly abnormal in their character, but are such facts to influence us against the proper and temperate use, of such beverages?

Do we refuse to take any of the other preparations which, like alcohol, are classed as poisonous, because the improper use of them would cause delirium and death?

A brief reference to the fallacies which have been brought forward in regard to the use of alcohol in any shape, as also to the contention of many distinguished men of the hygienic advantages to be derived from the proper employment of liquids containing alcohol, may next be considered in place.

The experiments of Dr. Percy have been often brought forward as proving something in regard to alcohol which was not true of any other substance.

This observer injected strong alcohol into the stomachs of dogs, quantity varying from 2 to 6 oz. Death resulted, and on examining the blood and brain for alcohol it was always found.

The presence of alcohol in the blood and brain has rather a horrible aspect, but when we know that there is no substance capable of being absorbed by the stomach and intestines which cannot also by proper means be detected in the blood and viscera, the subject loses much of its striking character.

Dr. Percy used alcohol of Sp. Gr. of 850°, which represents a mixture containing 80 per cent. of absolute alcohol. As the strongest brandy or whiskey contains but 40 per cent. of alcohol, the concentrated character of the liquor is at once seen. In one case six oz. were passed into the stomach of a dog, a quantity amply sufficient to cause the death of an adult man. The amount of essential oil present in garlic and onions is extremely small, far less in proportion than the quantity of alcohol contained in the mildest wines, and yet we cannot eat an onion without this essential oil passing into the blood and impregnating the air expired in breathing with its peculiar odour.

The experiments of Hammond, Prout, Bocker, Moleschott and others, would lead to the inference that when the system is supplied with an abundance of food, and when there are no special circumstances existing which render the use of alcohol advisable, its employment as an article of food is not to be commended or advised, but in their view two facts were established, viz., that by a moderate use the body gained in weight, and the excretions were diminished, phenomena due to the following causes: First, the retardation of the decay of the tissues. Secondly, the diminution of the consumption of the fat of the body. Thirdly, the increase in the assimilative powers of the system, by which the food was more completely appropriated and applied to the formation of tissue. On this subject, however, Boehm, in his paper on poisons in "Ziemssen's Index," remarks: "Unfortunately, many of the observations are wanting in that nicety which could entitle them to rank with those facts which may be considered as placed beyond dispute." If all their observations relating to the excretion of urea, carbonic acid, and the lowering of temperature be confined, there could be scarcely room for doubting any longer that alcohol diminishes the forces concerned in the metamorphosis of tissue.

The experiments of Obernier, Dumeril, L'Allemand and others, observed only slight fall of temperature from moderate doses, and only when large doses were given was it so depressed as to amount to several degrees of the centigrade scale.

Drs. Percy, Chambers, Aitken, and many others consider that during the retention of alcohol in the system it exerts an influence for good or evil, and although, in the strict sense of the term, it may not be considered an aliment, it undoubtedly aids the appropriation of aliment under some circumstances, and so far may be regarded as an accessory food in feeble health, or in disease as a medicine.

Dr. Harley considers it may be given with advantage when the nervous system is exhausted by an activity in excess of the other bodily functions.

As long as a person in ill health takes and digests food better with a small amount of alcohol than without, so long will alcohol be of service to him—in small amounts, aiding digestion; in larger, checking it. A moderate use of beer or of the weaker wines, viz., of the pure unbranded, well fermented wines may increase appetite and improve nutrition. On the other, hand the use of malt liquors, even when pure and good, is injurious to persons of sedentary habits, or unless much exercise is taken in the open air; but sound, well fermented beer is the best of all dinner drinks for persons of good digestion and working hard in the open air. At the Pennsylvania Sanitary Convention held at Philadelphia, in May, 1886, Prof. Wood read a practical paper on the Hygiene of Old Age, in which he said: "In the overfed American people, the habitual use of wine during youthful or middle age and rigorous health is, we think, an injury rather than a good, but when the powers of life are failing, when digestion is weak, and the multitudinous small ills of feebleness perplex and annoy, one or two glasses of generous wine at dinner aids digestion, quiets for the time being much nervous irritation, and in no way does harm."

The sum total of ruin wrought by alcohol in the world is appalling, but it is not lessened by our shutting our eyes to the good that wine properly used may achieve. When in the aged there is a distinct failure in the vital powers, and especially of digestive power, the call for the use of alcoholic stimulants is, in my opinion, imperative. In the treatment of many forms of disease, alcoholic stimulants, either in the form of brandy or strong wine, is indispensable, particularly in diphtheria, when the pulse is failing, and the redness of throat assumes a dusky hue. A child three years of age may have administered one or two drams of brandy every hour. In consumption the general consensus of opinion is certainly not yet in accord with the expressed views of the staff of the London Temperance Hospital on the inutility of stimulants in the treatment of diseases. That for the young and healthy stimulants in any form are entirely unnecessary, and that if indulged in may lead to habitual drunkenness and crime—we have too good reason for knowing.

We have also the experience of military and naval surgeons, and of large employers of labour, that the greatest fatigues, both in hot and cold climates, have been well borne, indeed, best borne by men who took no alcohol in any shape. This has been satisfactorily demonstrated in the expedition to the Red River under the then Colonel Wolseley. One of the officers of the expedition has said: "The men were pictures of good health and soldier-like condition whilst stationed off Prince Arthur's Landing. The men had fresh beef and potatoes every day. No spirits were allowed throughout the journey to Fort Garry, but all ranks had a daily large ration of tea. This was one of the few military expeditions undertaken by British troops where intoxicating liquors formed no part of the daily rations."

"Never had the soldiers of any nation been called on to perform more unceasingly hard work, and it may be confidently asserted without dread of contradiction, that no men were more cheerful or better behaved in every respect, and, with the exception of slight cases of diarrhoea, sickness was unknown."

In conclusion, I would say that it behooves the members of our profession to throw their influence into the scale of great moderation, that they should explain the limit of the useful power of alcoholic stimulants, and demonstrate how easily the line is passed from safety into danger, when it is taken daily as a common or accessory article of food.

A PAPER BY DR. MACMAHON.

MY LORD, LADIES AND GENTLEMEN,—The subject under consideration is one in which I have taken a good deal of interest, and it affords me great pleasure to have an opportunity of taking part in this discussion. I am firmly convinced that scientific evidence goes to strengthen the contention that alcohol is one of the good gifts of God to be received with thanksgiving; I believe that its moderate and proper use has been beneficial to mankind, and that only the abuse of it has been productive of ill health, poverty, misery and crime.

I must, before entering into this discussion, take exception to the title that has been given to it, "The Scientific Aspect of Intemperance." The monthly debauch that used to be recommended by our ancestors finds no apologist among the scientists of to-day, and there need be no discussion about the awful evils of intemperance. It would have been more correct to have styled it "The Scientific Aspect of the Alcohol Question," because I, for one, object to speaking from a standpoint that may be represented by some persons as opposed to that of those who argue against intemperance.

Probably none of us has pursued any original research on the action of alcohol, and our views have been largely formed from what we have seen and what we have read. I have seen nothing to convince me that the moderate use of alcohol has been in anyway prejudicial to health, and the overwhelming preponderance of the medical evidence I have consulted—and I have consulted a great many eminent authors—is in favour of the doctrine of moderation, as opposed to the doctrine of abstinence; and even those who think it better to abstain under ordinary conditions think it will prove beneficial under a large number of conditions, some of which I shall enumerate in the course of my remarks. Only a few, and of those few only two or three of any eminence favour the extreme position of the teetotalers.

The local action of alcohol on the living tissues depends, of course, on the strength of the spirit used. If pure, or only slightly diluted, they become blanched and corrugated, and the natural secretions are checked temporarily. But when properly diluted the flow of saliva is largely increased; on reaching the stomach its vessels dilate—its mucous membrane assumes a rosy red colour, and its glands commence to secrete copiously, and a desire for food is felt.

So far all is well. Such an action is desirable and beneficial. But if the spirit be too strong, or the quantity taken be too great, so as to paralyze instead of stimulate, the whole condition is changed—the mucous membrane becomes pale, and a quantity of slimy mucus replaces the normal secretion of gastric juice—appetite disappears and nausea and vomiting may supervene. What is to blame for this unfortunate condition? Is it the liquor? No, for we have seen on the authority of Prof. Lauder Brunton that the effect of a proper quantity, properly diluted, is favourable to digestion. We must rather blame either the ignorance of the drinker in using it in too concentrated a form, or his gluttony in taking too much. The lesson to be derived is to use alcohol only in its diluted form under ordinary circumstances. Alcohol is the active principle of spirituous beverages, just as theine is of tea, acetic acid of vinegar, or oil of mustard, of our table mustard. To use it undiluted, or only slightly diluted, is about as rational as to use theine instead of tea, or acetic acid in the place of vinegar. Our own experience teaches us how injuriously one's digestion is affected by strong tea, and so great a physiologist as Lauder Brunton says that it has a far greater effect in retarding digestion than even the stronger alcoholic beverages. But because strong tea completely stops the salivary digestion of starchy foods, and very much hinders the gastric digestion of albuminoids, and is one of the greatest causes of indigestion, must we forbid the moderate use of tea properly diluted, and deprive thousands of a beverage which is to them a source of enjoyment and

comfort? And yet a very much stronger case can be made against tea drinking with regard to its action on digestion than against the ordinary alcoholic table beverages. If the stomach is sluggish or temporarily below par from any cause, a glass of ale or wine will aid digestion by stimulating a supply of gastric juice, which ordinary food would not be powerful enough to cause. If you doubt this, try it, you exhausted brain worker, who think alcohol an unmitigated curse, some night when you come home weary and worn out by a long and arduous day's work; if the result is not gratifying to you and you do alter some of your views, you are one of those whom experience can teach nothing.

Alcohol properly used aids digestion in various ways. I quote Lauder Brunton—"It increases the appetite, stimulates the secretion of gastric juice, and quickens the movement of the stomach, thus bringing about a more thorough and rapid admixture of the contents of the stomach with the digestive juices, and facilitating the expulsion of gases."

It has been claimed that alcoholic beverages retard the action of the pepsine of the gastric juice, and thus have an injurious effect on the digestion of albuminoids in the stomach. But recent investigations have proved conclusively, that when the strength of the beverage does not exceed 80 per cent. of alcohol, it has not the slightest retarding effect, and that under 15 per cent. the effect is very slight. I might refer here to an experiment which is frequently performed by so-called temperance lecturers to the wonder and consternation of gaping crowds of ignorant and credulous people, who swallow down every word they say. They add some brandy to the white of an egg, and when the albumen is coagulated they hold up the egg, and say—See what a dreadful thing this alcohol is! it has cooked the egg! They are not honest enough to tell them that the normal gastric juice does precisely the same thing with albumen before digesting it; that tea will coagulate it as surely as does alcohol; or that we designedly cook our egg in boiling water before eating it. I wonder if these fellows take theirs raw?

I do not contend that healthy stomachs require any alcoholic stimulus, but I see no reason to doubt that a moderate quantity is quite harmless, and that as an adjunct to such foods as, for instance, cheese or lobster, its use will prove decidedly beneficial. An excessive quantity is certain to prove injurious. It is impossible to fix a definite quantity, as a moderate dose, which must not be exceeded. Each man's experience must teach him the quantity he may use with benefit and comfort. Garrod thinks that one ounce of alcohol daily may be considered an average daily allowance. This is equal to about eleven ounces of claret, or sixteen ounces of ale. If, then, healthy stomachs do not require it, why use it? I know no reason except that, as its use in moderation is harmless, they have a right to do that which they find pleasant and agreeable.

But it is different with persons with stomachs which are temporarily or permanently below par, e.g., convalescents, anæmic persons, feeble old persons or those exhausted by excessive mental or physical strain. In such cases the food does not sufficiently stimulate the stomach, and the secretion of digestive juices is so small that the food lies like a weight at the epigastrium, causing a feeling of heaviness and torpor, and probably pain and eructations. The diminished sensibility of the stomach can here be beneficially compensated by an extra stimulus, and a glass of ale or wine will restore the normal equilibrium, and quicken the otherwise slow and imperfect digestion. After absorption into the blood, alcohol lessens the power of the red corpuscles to give off oxygen, and therefore tends to lessen the oxidation of the tissues. As the functional activity of organs and the production of heat in the body depend on the process of oxidation, any interference with this process is not likely to be beneficial so long as both are going on in a healthy manner, and not too rapidly. Apparently this constitutes an objection to the use of alcohol in health. But this tendency is counteracted by the acceleration of the circulation, and if the quantity taken is small and not too frequently repeated,

Brunton says that no harm will result. If frequently taken, however, by persons in average health and with fair digestion, this property may cause imperfect combustion of fats and their accumulation in the tissues; and excessive drinking may even cause fatty degeneration of various organs. The moderate use never causes this fatty degeneration. This property of alcohol of lessening oxidation enormously increases its usefulness in fevers and severe inflammatory diseases, such as pneumonia, when oxidation is going on too rapidly; it lessens oxidation of the tissues, checks waste, reduces fever, and serves as a readily combustible food requiring no digestion to meet the wants of the organism until the digestive organs are ready to resume their functions. Though it generally quickens the pulse in health, it is a remarkable fact that in fevers the quick pulse generally becomes slower and stronger under its influence, thus economizing the vital power of the heart, and preventing death from exhaustion. While speaking of the action of alcohol on the heart, I might refer to a very ridiculous objection to its use made by Dr. B. W. Richardson. He argues that because alcohol increases the number of beats of the heart, that organ must wear out sooner than if no alcohol were used. If he had extended the same reasoning to football and cricket, he would have seen how ridiculous it is.

Alcohol dilates the superficial capillaries of the body, thus causing a larger surface of blood to be exposed to the cooling influence of the air. It should, therefore, not be taken before prolonged exposure to cold; but after the exposure is past, by stimulating the heart, and dilating the contracted vessels it equalizes the circulation, and may prevent a bronchitis or a pleurisy.

You will, no doubt, in this discussion, hear great stress laid on the views of Dr. B. W. Richardson—not a very great authority, it is true, but one quoted *ad nauseam* by teetotalers. I do not wonder at this, for there are so extremely few scientific writers whose views can be twisted into a condemnation of moderate drinking that they must either quote him or remain silent. Dr. Carpenter, for whose opinions I have the highest respect, at one time largely supported the views of Dr. Richardson, but in his latter years, when ripe experience triumphed over prejudice, he very materially altered his views, and used alcoholic beverages for some years before his death. He recommended malt liquors very highly in cases where the stomach labours under permanent deficiency of digestive powers, and says that "an alcoholic stimulus affords the only means of procuring digestion of the amount of food the system really requires in such cases."

Sir Henry Thompson is also a good deal quoted, but be not deceived! He preached not against the moderate and proper use of wine, but against the sin of gluttony, whether in eating or drinking, and is responsible for the opinion that over eating does more harm than over drinking. It is he also and not Mr. Goldwin Smith, who has said that a meal of fat pork and strong green tea is as apt to make a man beat his wife as an excess of alcohol. Permit me now to read a few quotations from recognized authorities, not quotations tortured out of their connection to secure a catch verdict, but full and candid expressions of opinion from the most eminent authorities.

Dr. Garod, the author of the great work on "Therapeutics," says: "Alcohol when dilute helps digestion. The majority of adults can take a moderate quantity in some form or another, not only with impunity but often with advantage. To many it is a source of much enjoyment, and as discomfort often springs from its discontinuance, it is difficult to say why it should be discontinued under ordinary circumstances. Among the nations who do not use alcohol drinks, the use of opium and Indian hemp is extremely common. There are no statistics to prove that abstinence from the moderate use of alcohol is attended with unusual length of life or improvement of health. Many people are unable to abstain for any length of time on account of their health failing under the trial. They exhibit symptoms which indicate that the nutrition of the system is not fully kept up."

Dr. James Risdon Bennett, a president of the Royal College of Physicians,

writes as follows: "The stomach of one man is offended and irritated by wine and his digestion impeded, whilst the appetite of another is improved and his digestion facilitated. The former is better without alcohol, and he comes into the category of fools if he takes it; but the latter has no claim to the character of physician if he abstains at the bidding of a mistaken fanatic or mere theorist. I believe that alcohol has a special advantage over other articles of diet in restoring exhausted nervous power or repairing the waste that has taken place. I believe alcohol to be among the gifts of God accorded to man for therapeutic as well as other beneficial purposes—to make glad his heart and strengthen his nerves. If every man is to forego his freedom of action because many make a licentious use of it, I know not what is the value of my freedom. If in the case of alcohol as of meat, or any other thing I am to abstain from what I conscientiously believe to be the lawful and beneficial use of it lest I make my brother to offend, my life would be an intolerable burden, worse than that of any ascetic monk that ever lived, and moreover I should be perpetually giving the lie to what I believe to be the truth, that every creature of God is good, and to be received with thanksgiving."

Prof. Alfred J. Bernays says: "The experience of mankind is better than individual experience, and for every medical man of distinction in favour of total abstinence, I can produce twenty against it. We often meet a friend in bad health, and, on enquiry, find that it is due to an experiment in teetotalism."

Dr. Gustav Braun, of Moscow, who used to lose 45 per cent. of his operations for cataract, the patients being badly nourished Russian peasants, and his colleague, Dr. Rosander, had the same experience. After trying many tonics, including quinine, without success, Dr. Braun gave a dose of brandy or sherry to every patient after operating, and repeated it two or three times a day for three days. The result was that the number of cases in which the eye was lost fell immediately from 45 per cent. to 6 per cent.

Dr. R. Brudenell Carter, the London oculist, says: "I believe the dietetic use of alcohol to be one which is simply indispensable for the whole of that large class of persons who, while they are subject to large expenditure of nervous force, are unable to digest more than a very moderate quantity of the dietetic equivalents of alcohol in the form of fats and sugar. I am myself among the most moderate drinkers of alcohol; and, on three separate occasions, I have endeavoured to become a total abstainer. Each time my health gave way in the attempt, which now, for some years past, I have not ventured to repeat; and my experience as a practitioner has taught me that many others are in a similar case."

Dr. Pavy, in his great work on Food and Dietetics, bears testimony to the value of light wines for dietetic purposes, and says that they constitute an exceedingly valuable form of stimulant both for the healthy and the sick.

There is an entire absence of any evidence to prove that abstinence is attended by either longer life or better health. The statistics of life assurance are valueless, because they distinguish between the temperate and intemperate, not between the moderate drinker and the total abstainer. When we compare the longevity of brewers with other craftsmen, we find that they compare very well indeed. Recent European statistics place the average longevity of brewers, bakers and butchers at fifty-four years, and this is next to the highest among craftsmen, gardeners and fishermen, leading with an average longevity of fifty-eight years. United States statistics give a still higher average to brewers, placing it at fifty-seven years. It is well known that brewers are beer-drinkers to a man, and they drink it rather freely and constantly, and yet they live much longer and preserve their physical energies better than the average workman of the United States. The peasantry of the wine-growing districts of France and Spain, where light, pure wine is drunk like water, are remarkably healthy, and dyspepsia among them is almost unknown. They will compare more than favourably as regards health with the tea-drinking Americans.

There is no writer whose views on this subject have a greater claim to respectful consideration than Sir James Paget, and they have special value because he considers the subject from a very broad standpoint, and treats of the effects of the use of alcohol, not on individuals, but on nations. Deductions drawn in this way are less apt to be erroneous than if drawn from a small number of cases. I need not, therefore, make any apology for quoting him at some length.

He points out that the opinions of medical men are, by a vast majority, in favour of moderation, as opposed to abstinence, and expresses his conviction that the moderate use of alcoholic beverages is generally beneficial. "The beliefs of reasonable people are," he says, "by a large majority favourable to moderation, and this should be regarded as of weight in this discussion. This readiness to fall in with custom goes far to prove that the evidence of the custom being a bad one is not clear. Its habitual use has been for centuries the custom of a large majority of civilized nations—there is a natural inclination among civilized men to drink, and in the absence of any clear evidence to the contrary, there must be a presumption that such a natural taste has a purpose for good, rather than for evil. Natural tastes of all creatures for foods and drinks is a guide for good rather than for evil. Doubtless some persons use alcoholic beverages to a mischievous excess; doubtless many use them to whom even in moderation they are useless or mischievous. But the fact of nearly universal custom is very weighty, and gives a strong presumption to the belief that they are beneficially adjusted to natural necessities. This presumption is borne out by a comparison between the races that do not, and those that do use alcoholic beverages. Compare the Eastern races with the Western. The Easterns do not live longer, nor are they healthier, than the Westerns, and as to working power, there can be no question that the advantage is on the side of those who use alcoholic drinks. And longevity is not the test of the value of the things on which we live. What is most desirable is a national power and will for good working and good thinking, and a long duration of the period of life fitted for these, and facts show that these are more nearly attained by those who drink alcoholic liquors than by those who do not. Again, knowing, as we do, the force of heredity, it is hardly conceivable that if moderation were in any sense mischievous, its evils should not have become evident during a thousand years of the practice. The offspring of thirty generations ought if injured thereby to be below the offspring of thirty generations of abstainers, such as the Mohammedans. But the result is the reverse of this. West against East, North against South, the heirs of the moderate drinkers are better men in mind and body than the heirs of the abstainers. In twenty generations every man has, according to Blackstone, over a million of ancestors. So we see the influence heredity ought to have on each individual. Now if the moderate use is to any degree mischievous, or the evil done to any extent transmissible, what should be the condition of every one of us if a measure of evil had come along each of a million lines, with constantly accumulating and converging force. It would be difficult to find a healthy family born of three successive generations of drunkards. If then healthy families are born after thirty generations of moderate drinkers, how can we fairly charge its moderate use with doing mischief? Is it not fair rather to think it probable that it has been beneficial, and one among the conditions to which we owe the still gradually increasing healthiness and working power of our race? It is a very bad argument to say that because a large quantity of alcohol does a man harm, a smaller quantity will do him some harm though less. The same reasoning has only to be extended to such drugs as quinine, arsenic, strychnia or common salt to show its absurdity. Each of those is a deadly poison in large quantities, whilst properly used quinine cures our ague, arsenic our skin diseases, strychnia is one of our most valued tonics, and common salt is a necessary of life.

"I think that in this, as in all other things lawful yet tempting, the discipline of moderation is better than the discipline of abstinence. It seems un-

reasonable to urge the discontinuance of a custom which is certainly pleasant and probably useful; and very unreasonable to require temperate persons who are an immense majority of the population, to cease to do that which is lawful, useful and agreeable, in order that the intemperate minority may be induced to cease to do that which is unlawful and mischievous. It would not be less unreasonable to urge that honest people should cease to gain money because there are some misers, thieves and swindlers." So much for Paget.

With regard to the remedy for intemperance, apart from religious influences, which must always occupy the first place, I believe that the encouragement of the use of the lighter alcoholic beverages, beer and pure unfortified and unadulterated wine will do more for the cause of true temperance than any thing else, certainly much more than all the prohibitory laws that ever disgraced the statute books. Dr. Rush, the father of the temperance movement in America, commended the habits of the Dutch inhabitants of Pennsylvania, saying, "Very few of them used distilled spirits in their families, the drinks being wine, beer and cider." The consumption of whiskey in the United States is only one-third as much per head to-day as in Rush's time—from A.D. 1805-25, and drunkenness has greatly diminished, though enormously more beer is drunk. We can learn a lesson from the continental temperance societies, whose whole efforts are directed towards repressing the sale of ardent spirits, and encouraging the substitution of pure wine and beer. At the International Temperance Congress, held at Antwerp in Sept. 1885, this was very strongly brought out. The European delegates did not favour a system which makes virtue, not the triumph of self-mastery over vicious desires and inclinations, but the effect of moral tyranny. It was deemed the policy of the penitentiary, whose inmates are negatively virtuous, because the opportunity for vice are removed. In one instance, the Dutch temperance societies set the good example of brewing beer themselves, their chief aim being the production of good malt liquors so as to popularize them. At the Colonial Exposition of Amsterdam, the beer halls conducted by the temperance societies did the most thriving business. Superintendents of lunatic and inebriate asylums testified that they scarcely ever saw a case of insanity or alcoholism due to the drinking of wine or beer. The victims whose ailment was traceable to alcoholic excess were almost invariably drinkers of ardent spirits.

Dr. Lancereaux of Paris, said, The remedy for intemperance lies in the use of the fermented beverages. "Beer," said he, "is the best of all—an excellent drink."

As my paper has already taken up too much time, I shall not trespass on you any longer. I thank you for the patient hearing you have given me.